

Methamphetamine hydrochloride must first be highly purified to have the volatility necessary for inhalation. The purified form has a crystalline appearance and is commonly called "ice." This inhalation drug problem is epidemic in Hawaii and on the West Coast. The data on pulmonary complications, both acute and chronic, are limited. Physiologically, methamphetamine is a direct central nervous system stimulant that also increases sympathetic nervous system activity and serum catecholamine concentrations. Smoking "ice" results in central nervous system symptoms of euphoria, agitation, and psychosis and cardiovascular symptoms of hypertension, tachycardia, and arrhythmias. Although a direct effect of methamphetamine on lung tissue has not yet been proved, acute dyspnea and cough are associated. Because smoking "ice" is a relatively new phenomenon, it is possible that some yet-undescribed pulmonary or radiographic finding may occur.

In patients with unexplained cough, dyspnea, or radiographic findings, clinicians should consider illicit drug abuse. A urine immunoassay can detect cocaine or methamphetamine metabolites as long as two days after use.

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Mechanical Respiratory Support at Home

LONG-TERM HOME VENTILATOR SUPPORT is an attractive option for many patients with severe stable respiratory failure due to a variety of neuromuscular, musculoskeletal, and pulmonary diseases. Guidelines and standards now have established reasonable indications, selection criteria, protocols, and the team approach needed to prepare for home care and for follow-up.

When ventilator support is initiated electively, patients are able to adjust more easily, with assistance from trained family members. Elective ventilator support is usually needed less than 12 hours a day. Although tracheostomy has been used frequently, noninvasive methods should be considered first, such as positive pressure ventilation using a nasal mask or mouthpiece; negative pressure ventilation using a cuirass, iron lung, or various other techniques; and a rocking bed. Recent experience with the nasal mask suggests its advantages in effectiveness and in avoiding upper airways obstruction. The cost involved in ventilator assistance on an elective basis is within reach of usual resources for many patients, about \$20 to \$40 a day.

In contrast, patients in intensive care units on discharge require long-term ventilator support, usually 12 to 24 hours a day. A tracheostomy is often needed both for ventilation and to remove secretions. Patients may have multiple impairments and limited functional performance. Because more complex care is required, patients are more often dependent on others for most of the 24 hours. Paid caregivers are generally required to assist the family. The financial costs—about \$150 to \$300 a day—are greater than most patients can arrange, unless third-party or public funds are available, but are still less than the costs for hospital care.

Adjusting to the unexpected and catastrophic situation is difficult for patients and families.

Hospital discharge preparation is a multidisciplinary team process that can enable most of these patients to go home or to another community alternative site. Experienced medical centers can assure a quality of care in the home environment that is comparable to that in a hospital. Two-year survival can be more than 70% for patients with neuromuscular disorders and more than 50% for patients with chronic obstructive pulmonary disease. Care must be coordinated with community agencies, a medical equipment company, and emergency services including the utility company, fire department, and a hospital emergency department. Patients generally prefer their quality of life at home when compared with the hospital setting; they can live in ways that are more personally satisfying and socially useful.

The challenges and burdens for a patient's family and the community home care resources can be enormous, particularly when care is complex and carried on for several years. The funding and community services required for these patients and their families need to be improved. Properly planned, however, long-term home respiratory support can be rewarding for patients, their families, and the medical team directing care.

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Inhaled Pentamidine Therapy for *Pneumocystis carinii* Pneumonia

INHALED PENTAMIDINE THERAPY is now indicated for the primary and secondary prophylaxis of *Pneumocystis carinii* pneumonia in patients with human immunodeficiency virus infection. Both primary prophylaxis, for persons with fewer than 2×10^6 per liter (200 per μ l) CD4 (helper) lymphocytes who have not had an episode of *P carinii* pneumonia, and secondary prophylaxis, for those patients who have had a previous episode of the disease, are administered through a Respigard II jet nebulizer (Marquest, Englewood, Colorado) at a dose of 300 mg of pentamidine isethionate once a month. This regimen is the result of a recent study of inhaled pentamidine as secondary prophylaxis for *P carinii* pneumonia that found giving 300 mg once a month superior to 30 mg or 150 mg given every two weeks. Relapse rates at 18 months were approximately 10% in patients receiving 300 mg once a month compared with a 65% relapse rate at one year in historical controls.

Toxicity from inhaled pentamidine has been minimal and limited to bronchospasm, preventable with the previous administration of inhaled bronchodilators.

Relapses of *P carinii* pneumonia after inhaled pentamidine therapy tend to occur in the apices of the lungs and possibly are related to poor drug deposition in those areas. Spontaneous pneumothorax (probably due to rupture of pneumatoceles in the apices) and extrapulmonary pneumocystosis have been reported in patients receiving inhaled pentamidine, raising a concern that pneumocystosis is in fact a systemic process and not one localized to the lung. Therefore, a combination of parenteral and local (inhaled) prophylaxis may be required. Two ongoing prophylaxis tri-